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<110> Bradfield, Christopher A.
Gu, Yi Zhong
Hogenesch, John B.

<120> cDNAs and Proteins Involved in Hypoxia, Circadian and Orphan Signal Transduction Pathways, and Methods of Use

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Asn Glu Phe Lys Leu Glu Leu Val Glu Lys Leu Phe Ala Glu Asp Thr
530 535 540

Glu Ala Lys Asn Pro Phe Ser Thr Gln Asp Thr Asp Leu Asp Leu Glu
545 550 555 560

Met Leu Ala Pro Tyr Ile Pro Met Asp Asp Asp Phe Gln Leu Arg Ser
565 570 575

Phe Asp Gln Leu Ser Pro Leu Glu Ser Ser Ser Ala Ser Pro Glu Ser
580 585 590

Ala Ser Pro Gln Ser Thr Val Thr Val Phe Gln Gln Thr Gln Ile Gln

595 600 605

Glu Pro Thr Ala Asn Ala Thr Thr Thr Ala Thr Thr Asp Glu Leu
610 615 620

Lys Thr Val Thr Lys Asp Arg Met Glu Asp Ile Lys Ile Leu Ile Ala
625 630 635 640

Ser Pro Ser Pro Thr His Ile His Lys Glu Thr Thr Ser Ala Thr Ser
645 650 655

Ser Pro Tyr Arg Asp Thr Gln Ser Arg Thr Ala Ser Pro Asn Arg Ala
660 665 670

Gly Lys Gly Val Ile Glu Gln Thr Glu Lys Ser His Pro Arg Ser Pro
675 680 685

Asn Val Leu Ser Val Ala Leu Ser Gln Arg Thr Thr Val Pro Glu Glu
690 695 700

Glu Leu Asn Pro Lys Ile Leu Ala Leu Gln Asn Ala Gln Arg Lys Arg
705 710 715 720

Lys Met Glu His Asp Gly Ser Leu Phe Gln Ala Val Gly Ile Gly Thr
725 730 735

Leu Leu Gln Gln Pro Asp Asp His Ala Ala Thr Thr Ser Leu Ser Trp
740 745 750

Lys Arg Val Lys Gly Cys Lys Ser Ser Glu Gln Asn Gly Met Glu Gln
755 760 765

Lys Thr Ile Ile Leu Ile Pro Ser Asp Leu Ala Cys Arg Leu Leu Gly
770 775 780

Gln Ser Met Asp Glu Ser Gly Leu Pro Gln Leu Thr Ser Tyr Asp Cys
785 790 795 800

Glu Val Asn Ala Pro Ile Gln Gly Ser Arg Asn Leu Leu Gln Gly Glu
805 810 815

Glu Leu Leu Arg Ala Leu Asp Gln Val Asn
820 825

<210> 11
<211> 870
<212> PRT
<213> Homo sapiens

<400> 11

Met Thr Ala Asp Lys Glu Lys Lys Arg Ser Ser Ser Glu Arg Arg Lys
1 5 10 15

Glu Lys Ser Arg Asp Ala Ala Arg Cys Arg Arg Ser Lys Glu Thr Glu
20 25 30

Val Phe Tyr Glu Leu Ala His Glu Leu Pro Leu Pro His Ser Val Ser
35 40 45

Ser His Leu Asp Lys Ala Ser Ile Met Arg Leu Ala Ile Ser Phe Leu
50 55 60

Arg Thr His Lys Leu Leu Ser Ser Val Cys Ser Glu Asn Glu Ser Glu
65 70 75 80

Ala Glu Ala Asp Gln Gln Met Asp Asn Leu Tyr Leu Lys Ala Leu Glu
85 90 95

Gly Phe Ile Ala Val Val Thr Gln Asp Gly Asp Met Ile Phe Leu Ser
100 105 110

Glu Asn Ile Ser Lys Phe Met Gly Leu Thr Gln Val Glu Leu Thr Gly
115 120 125

His Ser Ile Phe Asp Phe Thr His Pro Cys Asp His Glu Glu Ile Arg
130 135 140

Glu Asn Leu Ser Leu Lys Asn Gly Ser Gly Phe Gly Lys Lys Ser Lys
145 150 155 160

Asp Met Ser Thr Glu Arg Asp Phe Phe Met Arg Met Lys Cys Thr Val
165 170 175

Thr Asn Arg Gly Arg Thr Val Asn Leu Lys Ser Ala Thr Trp Lys Val
180 185 190

Leu His Cys Thr Gly Gln Val Lys Val Tyr Asn Asn Cys Pro Pro His
195 200 205

Asn Ser Leu Cys Gly Tyr Lys Glu Pro Leu Leu Ser Cys Leu Ile Ile
210 215 220

Met Cys Glu Pro Ile Gln His Pro Ser His Met Asp Ile Pro Leu Asp
225 230 235 240

Ser Lys Thr Phe Leu Ser Arg His Ser Met Asp Met Lys Phe Thr Tyr
245 250 255

Cys Asp Asp Arg Ile Thr Glu Leu Ile Gly Tyr His Pro Glu Glu Leu
260 265 270

Leu Gly Arg Ser Ala Tyr Glu Phe Tyr His Ala Leu Asp Ser Glu Asn
275 280 285

Met Thr Lys Ser His Gln Asn Leu Cys Thr Lys Gly Gln Val Val Ser
290 295 300

Gly Gln Tyr Arg Met Leu Ala Lys His Gly Gly Tyr Val Trp Leu Glu
305 310 315 320

Thr Gln Gly Thr Val Ile Tyr Asn Pro Arg Asn Leu Gln Pro Gln Cys
325 330 335

Ile Met Cys Val Asn Tyr Val Leu Ser Glu Ile Glu Lys Asn Asp Val
340 345 350

Val Phe Ser Met Asp Gln Thr Glu Ser Leu Phe Lys Pro His Leu Met
355 360 365

Ala Met Asn Ser Ile Phe Asp Ser Ser Gly Lys Gly Ala Val Ser Glu
370 375 380

Lys Ser Asn Phe Leu Phe Thr Lys Leu Lys Glu Glu Pro Glu Glu Leu
385 390 395 400

Ala Gln Leu Ala Pro Thr Pro Gly Asp Ala Ile Ile Ser Leu Asp Phe
405 410 415

Gly Asn Gln Asn Phe Glu Glu Ser Ser Ala Tyr Gly Lys Ala Ile Leu
420 425 430

Pro Pro Ser Gln Pro Trp Ala Thr Glu Leu Arg Ser His Ser Thr Gln
435 440 445

Ser Glu Ala Gly Ser Leu Pro Ala Phe Thr Val Pro Gln Ala Ala Ala
450 455 460

Pro Gly Ser Thr Thr Pro Ser Ala Thr Ser Ser Ser Ser Ser Cys Ser
465 470 475 480

Thr Pro Asn Ser Pro Glu Asp Tyr Tyr Thr Ser Leu Asp Asn Asp Leu
485 490 495

Lys Ile Glu Val Ile Glu Lys Leu Phe Ala Met Asp Thr Glu Ala Lys
500 505 510

Asp Gln Cys Ser Thr Gln Thr Asp Phe Asn Glu Leu Asp Leu Glu Thr
515 520 525

Leu Ala Pro Tyr Ile Pro Met Asp Gly Glu Gly Phe Gln Leu Ser Pro
530 535 540

Ile Cys Pro Glu Glu Arg Leu Leu Ala Glu Asn Pro Gln Ser Thr Pro
545 550 555 560

Gln His Cys Phe Ser Ala Met Thr Asn Ile Phe Gln Pro Leu Ala Pro
565 570 575

Val Ala Pro His Ser Pro Phe Leu Leu Asp Lys Phe Gln Gln Gln Leu
580 585 590

Glu Ser Lys Lys Thr Glu Pro Glu Arg Arg Pro Met Ser Ser Ile Phe
595 600 605

Phe Asp Ala Gly Ser Lys Ala Ser Leu Pro Pro Cys Cys Gly Gln Ala

610 615 620

Ser Thr Pro Leu Ser Ser Met Gly Gly Arg Ser Asn Thr Gln Trp Pro
625 630 635 640

Pro Asp Pro Pro Leu His Phe Gly Pro Thr Lys Trp Ala Val Gly Asp
645 650 655

Gln Arg Thr Glu Phe Leu Gly Ala Ala Pro Leu Gly Pro Pro Val Ser
660 665 670

Pro Pro His Val Ser Thr Phe Lys Thr Arg Ser Ala Lys Gly Phe Gly
675 680 685

Ala Arg Gly Pro Asn Val Leu Ser Pro Ala Met Val Ala Leu Ser Asn
690 695 700

Lys Leu Lys Leu Lys Arg Gln Leu Glu Tyr Glu Lys Gln Ala Phe Gln
705 710 715 720

Asp Pro Ser Gly Gly Asp Pro Pro Gly Gly Ser Thr Ser His Leu Met
725 730 735

Trp Lys Arg Met Lys Asn Leu Arg Gly Gly Ser Cys Pro Leu Met Pro
740 745 750

Asp Lys Pro Leu Ser Ala Asn Val Pro Asn Asp Lys Leu Thr Gln Asn
755 760 765

Ser Met Arg Gly Leu Gly His Pro Leu Arg His Leu Pro Leu Pro Gln
770 775 780

Pro Pro Ser Ala Ile Ser Pro Gly Glu Asn Ser Lys Ser Arg Phe Pro
785 790 795 800

Pro Gln Cys Tyr Ala Thr Gln Tyr Gln Asp Tyr Ser Leu Ser Ser Ala
805 810 815

His Lys Val Ser Gly Met Ala Ser Arg Leu Leu Gly Pro Ser Phe Glu
820 825 830

Ser Tyr Leu Leu Pro Glu Leu Thr Arg Tyr Asp Arg Glu Val Lys Val
835 840 845

Pro Val Leu Gly Ser Ser Thr Leu Leu Gln Gly Gly Asp Leu Leu Arg
850 855 860

Ala Leu Asp Gln Ala Thr
865 870

<210> 12
<211> 624
<212> PRT
<213> Homo sapiens

<400> 12

```
Met Ser Lys Glu Ala Val Ser Leu Trp Ala Leu Thr Val Ser Leu Gln
1               5                  10                  15

Pro Pro Val Pro Leu Cys Val Cys Arg Glu Met Thr Gly Ser Gly Arg
            20                  25                  30

Arg Lys Gln Gln Cys Val Thr Leu Pro Phe Ile Ser Arg Glu Leu Cys
        35                  40                  45

Phe Tyr Leu Leu Leu Phe Pro Pro Pro Arg Leu Glu Tyr Thr Glu His
    50                  55                  60

Gln Gly Gly Ile Lys Asn Ala Arg Glu Ala His Ser Gln Ile Glu Lys
65                  70                  75                  80

Arg Arg Arg Asp Lys Met Asn Ser Phe Ile Asp Glu Leu Ala Ser Leu
                85                  90                  95

Val Pro Thr Cys Asn Ala Met Ser Arg Lys Leu Asp Lys Leu Thr Val
            100                 105                 110

Leu Arg Met Ala Val Gln His Met Lys Thr Leu Arg Gly Ala Thr Asn
        115                 120                 125

Pro Tyr Thr Glu Ala Asn Tyr Lys Pro Thr Phe Leu Ser Asp Asp Glu
    130                 135                 140

Leu Lys His Leu Ile Leu Arg Ala Ala Asp Gly Phe Leu Phe Val Val
145                 150                 155                 160

Gly Cys Asp Arg Gly Lys Ile Leu Phe Val Ser Glu Ser Val Phe Lys
                165                 170                 175

Ile Leu Asn Tyr Ser Gln Asn Asp Leu Ile Gly Gln Ser Leu Phe Asp
            180                 185                 190

Tyr Leu His Pro Lys Asp Ile Ala Lys Val Lys Glu Gln Leu Ser Ser
        195                 200                 205

Ser Asp Thr Ala Pro Arg Glu Arg Leu Ile Asp Ala Lys Thr Gly Leu
    210                 215                 220

Pro Val Lys Thr Asp Ile Thr Pro Gly Pro Ser Arg Leu Cys Ser Gly
225                 230                 235                 240

Ala Arg Arg Ser Phe Phe Cys Arg Met Lys Cys Asn Arg Pro Ser Val
                245                 250                 255

Lys Val Glu Asp Lys Asp Phe Pro Ser Thr Cys Ser Lys Lys Lys Ala
            260                 265                 270

Asp Arg Lys Ser Phe Cys Thr Ile His Ser Thr Gly Tyr Leu Lys Ser
        275                 280                 285
```

```
Trp Pro Pro Thr Lys Met Gly Leu Asp Glu Asp Asn Glu Pro Asp Asn
    290                 295                 300

Glu Gly Cys Asn Leu Ser Cys Leu Val Ala Ile Gly Arg Leu His Ser
305                 310                 315                 320

His Val Val Pro Gln Pro Val Asn Gly Glu Ile Arg Val Lys Ser Met
                325                 330                 335

Glu Tyr Val Ser Arg His Ala Ile Asp Gly Lys Phe Val Phe Val Asp
            340                 345                 350

Gln Arg Ala Thr Ala Ile Leu Ala Tyr Leu Pro Gln Glu Leu Leu Gly
        355                 360                 365

Thr Ser Cys Tyr Glu Tyr Phe His Gln Asp Asp Ile Gly His Leu Ala
    370                 375                 380

Glu Cys His Arg Gln Val Leu Gln Thr Arg Glu Lys Ile Thr Thr Asn
385                 390                 395                 400

Cys Tyr Lys Phe Lys Ile Lys Asp Gly Ser Phe Ile Thr Leu Arg Ser
                405                 410                 415

Arg Trp Phe Ser Phe Met Asn Pro Trp Thr Lys Glu Val Glu Tyr Ile
            420                 425                 430

Val Ser Thr Asn Thr Val Val Leu Ala Asn Val Leu Glu Gly Gly Asp
        435                 440                 445

Pro Thr Phe Pro Gln Leu Thr Ala Ser Pro His Ser Met Asp Ser Met
    450                 455                 460

Leu Pro Ser Gly Glu Gly Gly Pro Lys Arg Thr His Pro Thr Val Pro
465                 470                 475                 480

Gly Ile Pro Gly Gly Thr Arg Ala Gly Ala Gly Lys Ile Gly Arg Met
                485                 490                 495

Ile Ala Glu Glu Ile Met Glu Ile His Arg Ile Arg Gly Ser Leu Arg
            500                 505                 510

Ser Ser Cys Gly Ser Ser Pro Leu Asn Ile Thr Ser Thr Pro Pro Pro
        515                 520                 525

Asp Ala Ser Ser Pro Gly Gly Lys Lys Ile Leu Asn Gly Gly Thr Pro
    530                 535                 540

Asp Ile Pro Ser Ser Gly Leu Leu Ser Gly Gln Ala Gln Glu Asn Pro
545                 550                 555                 560

Gly Tyr Pro Tyr Ser Asp Ser Ser Ser Ile Leu Gly Glu Asn Pro His
                565                 570                 575

Ile Gly Ile Asp Met Ile Asp Asn Asp Gln Gly Ser Ser Ser Pro Ser
```

```
            580                 585                 590

Asn Asp Glu Ala Ala Met Ala Val Ile Met Ser Leu Leu Glu Ala Asp
        595                 600                 605

Ala Gly Leu Gly Gly Pro Val Asp Phe Ser Asp Leu Pro Trp Pro Leu
    610                 615                 620
```

<210> 13
<211> 626
<212> PRT
<213> Homo sapiens

<400> 13

```
Met Asp Glu Asp Glu Lys Asp Arg Ala Lys Arg Ala Ser Arg Asn Lys
1               5                  10                  15

Ser Glu Lys Lys Arg Arg Asp Gln Phe Asn Val Leu Ile Lys Glu Leu
            20                  25                  30

Ser Ser Met Leu Pro Gly Asn Thr Arg Lys Met Asp Lys Thr Thr Val
        35                  40                  45

Leu Glu Glu Val Ile Gly Phe Leu Gln Lys His Asn Glu Val Ser Ala
    50                  55                  60

Gln Thr Glu Ile Cys Asp Ile Gln Gln Asp Trp Lys Pro Ser Phe Leu
65                  70                  75                  80

Ser Asn Glu Glu Phe Thr Gln Leu Met Leu Glu Ala Leu Asp Gly Phe
                85                  90                  95

Ile Ile Ala Val Thr Thr Asp Gly Ser Ile Ile Tyr Val Ser Asp Ser
            100                 105                 110

Ile Thr Pro Leu Leu Gly His Leu Pro Ser Asp Val Met Asp Gln Asn
        115                 120                 125

Leu Leu Asn Phe Leu Pro Glu Gln Glu His Ser Glu Val Tyr Lys Ile
    130                 135                 140

Leu Ser Ser His Met Leu Val Thr Asp Ser Pro Ser Pro Glu Tyr Leu
145                 150                 155                 160

Lys Ser Asp Gly Asp Leu Glu Phe Tyr Cys His Leu Leu Arg Gly Ser
                165                 170                 175

Leu Asn Pro Lys Glu Phe Pro Thr Tyr Glu Tyr Ile Lys Phe Val Gly
            180                 185                 190

Asn Phe Arg Ser Tyr Asn Asn Val Pro Ser Pro Ser Cys Asn Gly Phe
        195                 200                 205

Asp Asn Thr Leu Ser Arg Pro Cys Arg Val Pro Leu Gly Lys Glu Val
    210                 215                 220
```

```
Cys Phe Ile Ala Thr Val Arg Leu Ala Thr Pro Gln Phe Leu Lys Glu
225                 230                 235                 240

Met Cys Ile Val Asp Glu Pro Leu Glu Glu Phe Thr Ser Arg His Ser
                245                 250                 255

Leu Glu Trp Lys Phe Leu Phe Leu Asp His Arg Ala Pro Pro Ile Ile
            260                 265                 270

Gly Tyr Leu Pro Phe Glu Val Leu Gly Thr Ser Gly Tyr Asp Tyr Tyr
        275                 280                 285

His Ile Asp Asp Leu Glu Leu Leu Ala Arg Cys His Gln His Leu Met
    290                 295                 300

Gln Phe Gly Lys Gly Lys Ser Cys Cys Tyr Arg Phe Leu Thr Lys Gly
305                 310                 315                 320

Gln Gln Trp Ile Trp Leu Gln Thr His Tyr Tyr Ile Thr Tyr His Gln
                325                 330                 335

Trp Asn Ser Lys Pro Glu Phe Ile Val Cys Thr His Ser Val Val Ser
            340                 345                 350

Tyr Ala Asp Val Arg Val Glu Arg Arg Gln Glu Leu Ala Leu Glu Asp
        355                 360                 365

Pro Pro Ser Glu Ala Leu His Ser Ser Ala Leu Lys Asp Lys Gly Ser
    370                 375                 380

Ser Leu Glu Pro Arg Gln His Phe Asn Ala Leu Asp Val Gly Ala Ser
385                 390                 395                 400

Gly Leu Asn Thr Ser His Ser Pro Ser Ala Ser Ser Arg Ser Ser His
                405                 410                 415

Lys Ser Ser His Thr Ala Met Ser Glu Pro Thr Ser Thr Pro Thr Lys
            420                 425                 430

Leu Met Ala Glu Ala Ser Thr Pro Ala Leu Pro Arg Ser Ala Thr Leu
        435                 440                 445

Pro Gln Glu Leu Pro Val Pro Gly Leu Ser Gln Ala Ala Thr Met Pro
    450                 455                 460

Ala Pro Leu Pro Ser Pro Ser Ser Cys Asp Leu Thr Gln Gln Leu Leu
465                 470                 475                 480

Pro Gln Thr Val Leu Gln Ser Thr Pro Ala Pro Met Ala Gln Phe Ser
                485                 490                 495

Ala Gln Phe Ser Met Phe Gln Thr Ile Lys Asp Gln Leu Glu Gln Arg
            500                 505                 510
```

Thr Arg Ile Leu Gln Ala Asn Ile Arg Trp Gln Gln Glu Glu Leu His
515 520 525

Lys Ile Gln Glu Gln Leu Cys Leu Val Gln Asp Ser Asn Val Gln Met
530 535 540

Phe Leu Gln Gln Pro Ala Val Ser Leu Ser Phe Ser Ser Thr Gln Arg
545 550 555 560

Pro Glu Ala Gln Gln Gln Leu Gln Gln Arg Ser Ala Ala Val Thr Gln
565 570 575

Pro Gln Leu Gly Ala Gly Pro Gln Leu Pro Gly Gln Ile Ser Ser Ala
580 585 590

Gln Val Thr Ser Gln His Leu Leu Arg Glu Ser Ser Val Ile Ser Thr
595 600 605

Gln Gly Pro Lys Pro Met Arg Ser Ser Gln Leu Met Gln Ser Ser Gly
610 615 620

Arg Ser
625

<210> 14
<211> 481
<212> PRT
<213> Homo sapiens

<400> 14

Asn Ser Arg Arg Pro Ala Leu Arg Ala Ala Ala Ala Gly Ala Arg Pro
1 5 10 15

Ala Gly Gly Pro Gly Ser Gln Pro Pro Glu Gln His Leu Gly Gly His
20 25 30

Ile Leu Gln Ser Leu Asp Gly Phe Val Phe Ala Leu Asn Gln Glu Gly
35 40 45

Lys Phe Leu Tyr Ile Ser Glu Thr Val Ser Ile Tyr Leu Gly Leu Ser
50 55 60

Gln Val Glu Met Thr Gly Ser Ser Val Phe Asp Tyr Ile His Pro Gly
65 70 75 80

Asp His Ser Glu Val Leu Glu Gln Leu Gly Leu Arg Thr Pro Thr Pro
85 90 95

Gly Pro Pro Thr Pro Pro Ser Val Ser Ser Ser Ser Ser Ser Ser Ser
100 105 110

Ser Leu Ala Asp Thr Pro Glu Ile Glu Ala Ser Leu Thr Lys Val Pro
115 120 125

Pro Ser Ser Leu Val Gln Glu Arg Ser Phe Phe Val Arg Met Lys Ser
130 135 140

```
Thr Leu Thr Lys Arg Gly Leu His Val Lys Ala Ser Gly Tyr Lys Val
145                 150                 155                 160

Ile His Val Thr Gly Arg Leu Arg Ala His Ala Leu Gly Leu Val Ala
                165                 170                 175

Leu Gly His Thr Leu Pro Pro Ala Pro Leu Ala Glu Leu Pro Leu His
            180                 185                 190

Gly His Met Ile Val Phe Arg Leu Ser Leu Gly Leu Thr Ile Leu Ala
        195                 200                 205

Cys Glu Ser Arg Val Ser Asp His Met Asp Leu Gly Pro Ser Glu Leu
    210                 215                 220

Val Gly Arg Ser Cys Tyr Gln Phe Val His Gly Gln Asp Ala Thr Arg
225                 230                 235                 240

Ile Arg Gln Ser His Val Asp Leu Leu Asp Lys Gly Gln Val Met Thr
                245                 250                 255

Gly Tyr Tyr Arg Trp Leu Gln Arg Ala Gly Gly Phe Val Trp Leu Gln
            260                 265                 270

Ser Val Ala Thr Val Ala Gly Ser Gly Lys Ser Pro Gly Glu His His
        275                 280                 285

Val Leu Trp Val Ser His Val Leu Ser Gln Ala Glu Gly Gly Gln Thr
    290                 295                 300

Pro Leu Asp Ala Phe Gln Leu Pro Ala Ser Val Ala Cys Glu Glu Ala
305                 310                 315                 320

Ser Ser Pro Gly Pro Glu Pro Thr Glu Pro Glu Pro Pro Thr Glu Gly
                325                 330                 335

Lys Gln Ala Ala Pro Ala Glu Asn Glu Ala Pro Gln Thr Gln Gly Lys
            340                 345                 350

Arg Ile Lys Val Glu Pro Gly Pro Arg Glu Thr Lys Gly Ser Glu Asp
        355                 360                 365

Ser Gly Asp Glu Asp Pro Ser Ser His Pro Ala Thr Pro Arg Pro Glu
    370                 375                 380

Phe Thr Ser Val Ile Arg Ala Gly Val Leu Lys Gln Asp Pro Val Arg
385                 390                 395                 400

Pro Trp Gly Leu Ala Pro Pro Gly Asp Pro Pro Pro Thr Leu Leu His
                405                 410                 415

Ala Gly Phe Leu Pro Pro Val Val Arg Gly Leu Cys Thr Pro Gly Thr
            420                 425                 430
```

```
Ile Arg Tyr Gly Pro Ala Glu Leu Gly Leu Val Tyr Pro His Leu Gln
        435                 440                 445

Arg Leu Gly Pro Gly Pro Ala Leu Pro Glu Ala Phe Tyr Pro Pro Leu
    450                 455                 460

Gly Leu Pro Tyr Pro Gly Pro Ala Gly Thr Arg Leu Pro Arg Lys Gly
465                 470                 475                 480

Asp
```

<210> 15
<211> 691
<212> PRT
<213> Homo sapiens

<400> 15

```
Met Ala Pro Thr Lys Pro Ser Phe Gln Gln Asp Pro Ser Arg Arg Glu
1               5                   10                  15

Arg Leu Gln Ala Leu Arg Lys Glu Lys Ser Arg Asp Ala Ala Arg Ser
            20                  25                  30

Arg Arg Gly Lys Glu Asn Phe Glu Phe Tyr Glu Leu Ala Lys Leu Leu
        35                  40                  45

Pro Leu Pro Ala Ala Ile Thr Ser Gln Leu Asp Lys Ala Ser Ile Ile
    50                  55                  60

Arg Leu Thr Ile Ser Tyr Leu Lys Met Arg Asp Phe Ala Asn Gln Gly
65                  70                  75                  80

Asp Pro Pro Trp Asn Leu Arg Met Glu Gly Pro Pro Pro Asn Thr Ser
                85                  90                  95

Val Lys Gly Ala Gln Arg Arg Arg Ser Pro Ser Ala Leu Ala Ile Glu
            100                 105                 110

Val Phe Glu Ala His Leu Gly Ser His Ile Leu Gln Ser Leu Asp Gly
        115                 120                 125

Phe Val Phe Ala Leu Asn Gln Glu Gly Lys Phe Leu Tyr Ile Ser Glu
    130                 135                 140

Thr Val Ser Ile Tyr Leu Gly Leu Ser Gln Val Glu Leu Thr Gly Ser
145                 150                 155                 160

Ser Val Phe Asp Tyr Val His Pro Gly Asp His Val Glu Met Ala Glu
                165                 170                 175

Gln Leu Gly Met Lys Leu Pro Pro Gly Arg Gly Leu Leu Ser Gln Gly
            180                 185                 190

Thr Ala Glu Asp Gly Ala Ser Ser Ala Ser Ser Ser Ser Gln Ser Glu
```

```
        195                 200                 205

Thr Pro Glu Pro Val Glu Ser Thr Ser Pro Ser Leu Leu Thr Thr Asp
    210                 215                 220

Asn Thr Leu Glu Arg Ser Phe Phe Ile Arg Met Lys Ser Thr Leu Thr
225                 230                 235                 240

Lys Arg Gly Val His Ile Lys Ser Ser Gly Tyr Lys Val Ile His Ile
                245                 250                 255

Thr Gly Arg Leu Arg Leu Arg Val Ser Leu Ser His Gly Arg Thr Val
            260                 265                 270

Pro Ser Gln Ile Met Gly Leu Val Val Val Ala His Ala Leu Pro Pro
        275                 280                 285

Pro Thr Ile Asn Glu Val Arg Ile Asp Cys His Met Phe Val Thr Arg
    290                 295                 300

Val Asn Met Asp Leu Asn Ile Ile Tyr Cys Glu Asn Arg Ile Ser Asp
305                 310                 315                 320

Tyr Met Asp Leu Thr Pro Val Asp Ile Val Gly Lys Arg Cys Tyr His
                325                 330                 335

Phe Ile His Ala Glu Asp Val Glu Gly Ile Arg His Ser His Leu Asp
            340                 345                 350

Leu Leu Asn Lys Gly Gln Cys Val Thr Lys Tyr Tyr Arg Trp Met Gln
        355                 360                 365

Lys Asn Gly Gly Tyr Ile Trp Ile Gln Ser Ser Ala Thr Ile Ala Ile
    370                 375                 380

Asn Ala Lys Asn Ala Asn Glu Lys Asn Ile Ile Trp Val Asn Tyr Leu
385                 390                 395                 400

Leu Ser Asn Pro Glu Tyr Lys Asp Thr Pro Met Asp Ile Ala Gln Leu
                405                 410                 415

Pro His Leu Pro Glu Lys Thr Ser Glu Ser Ser Glu Thr Ser Asp Ser
            420                 425                 430

Glu Ser Asp Ser Lys Asp Thr Ser Gly Ile Thr Glu Asp Asn Glu Asn
        435                 440                 445

Ser Lys Ser Asp Glu Lys Gly Asn Gln Ser Glu Asn Ser Glu Asp Pro
    450                 455                 460

Glu Pro Asp Arg Lys Lys Ser Gly Asn Ala Cys Asp Asn Asp Met Asn
465                 470                 475                 480

Cys Asn Asp Asp Gly His Ser Ser Ser Asn Pro Asp Ser Arg Asp Ser
                485                 490                 495
```

```
Asp Asp Ser Phe Glu His Ser Asp Phe Glu Asn Pro Lys Ala Gly Glu
            500                 505                 510

Asp Gly Phe Gly Ala Leu Gly Ala Met Gln Ile Lys Val Glu Arg Tyr
        515                 520                 525

Val Glu Ser Glu Ser Asp Leu Arg Leu Gln Asn Cys Glu Ser Leu Thr
    530                 535                 540

Ser Asp Ser Ala Lys Asp Ser Asp Ser Ala Gly Glu Ala Gly Ala Gln
545                 550                 555                 560

Ala Ser Ser Lys His Gln Lys Arg Lys Lys Arg Arg Lys Arg Gln Lys
                565                 570                 575

Gly Gly Ser Ala Ser Arg Arg Arg Leu Ser Ser Ala Ser Ser Pro Gly
            580                 585                 590

Gly Leu Asp Ala Gly Leu Val Glu Pro Pro Arg Leu Leu Ser Ser Pro
        595                 600                 605

Asn Ser Ala Ser Val Leu Lys Ile Lys Thr Glu Ile Ser Glu Pro Ile
    610                 615                 620

Asn Phe Asp Asn Asp Ser Ser Ile Trp Asn Tyr Pro Pro Asn Arg Glu
625                 630                 635                 640

Ile Ser Arg Asn Glu Ser Pro Tyr Ser Met Thr Lys Pro Pro Ser Ser
                645                 650                 655

Glu His Phe Pro Ser Pro Gln Gly Gly Gly Gly Gly Gly Gly Gly Gly
            660                 665                 670

Gly Gly Leu His Val Ala Ile Pro Asp Ser Val Leu Thr Pro Pro Gly
        675                 680                 685

Ala Asp Gly
    690

<210>  16
<211>  662
<212>  PRT
<213>  mus

<400>  16

Met Asp Trp Asp Gln Asp Arg Ser Asn Thr Glu Leu Arg Lys Glu Lys
1               5                   10                  15

Ser Arg Asp Ala Ala Arg Ser Arg Arg Ser Gln Glu Thr Glu Val Leu
            20                  25                  30

Tyr Gln Leu Ala His Thr Leu Pro Phe Ala Arg Gly Val Ser Ala His
        35                  40                  45
```

```
Leu Asp Lys Ala Ser Ile Met Arg Leu Thr Ile Ser Tyr Leu Arg Met
    50                  55                  60

His Arg Leu Cys Ala Ala Gly Glu Trp Asn Gln Val Glu Lys Gly Gly
65                  70                  75                  80

Glu Pro Leu Asp Ala Cys Tyr Leu Lys Ala Leu Glu Gly Phe Val Met
                85                  90                  95

Val Leu Thr Ala Glu Gly Asp Met Ala Tyr Leu Ser Glu Asn Val Ser
            100                 105                 110

Lys His Leu Gly Leu Ser Gln Leu Glu Leu Ile Gly His Ser Ile Phe
        115                 120                 125

Asp Phe Ile His Pro Cys Asp Gln Glu Glu Leu Gln Asp Ala Leu Thr
    130                 135                 140

Pro Arg Pro Asn Leu Ser Lys Lys Lys Leu Glu Ala Pro Thr Glu Arg
145                 150                 155                 160

His Phe Ser Leu Arg Met Lys Ser Thr Leu Thr Ser Arg Gly Arg Thr
                165                 170                 175

Leu Asn Leu Lys Ala Ala Thr Trp Lys Val Leu His Cys Ser Gly His
            180                 185                 190

Met Arg Ala Tyr Lys Pro Pro Ala Gln Thr Ser Pro Ala Gly Ser Pro
        195                 200                 205

Arg Ser Glu Pro Pro Leu Gln Cys Leu Val Leu Ile Cys Glu Ala Ile
    210                 215                 220

Pro His Pro Ala Ser Leu Glu Pro Pro Leu Gly Arg Gly Ala Phe Leu
225                 230                 235                 240

Ser Arg His Ser Leu Asp Met Lys Phe Thr Tyr Cys Asp Glu Arg Ile
                245                 250                 255

Ala Glu Val Ala Gly Tyr Ser Pro Asp Asp Leu Ile Gly Cys Ser Ala
            260                 265                 270

Tyr Glu Tyr Ile His Ala Leu Asp Ser Asp Ala Val Ser Arg Ser Ile
        275                 280                 285

His Thr Leu Leu Ser Lys Gly Gln Ala Val Thr Gly Gln Tyr Arg Phe
    290                 295                 300

Leu Ala Arg Thr Gly Gly Tyr Leu Trp Thr Gln Thr Gln Ala Thr Val
305                 310                 315                 320

Val Ser Gly Gly Arg Gly Pro Gln Ser Glu Ser Ile Ile Cys Val His
                325                 330                 335

Phe Leu Ile Ser Arg Val Glu Glu Thr Gly Val Val Leu Ser Leu Glu
```

```
            340                 345                 350

Gln Thr Glu Gln His Thr Arg Arg Pro Pro Arg Leu Ser Ala Ser Ser
        355                 360                 365

Gln Lys Gly Ile Pro Gly Asn Ser Val Asp Ser Pro Ala Pro Arg Ile
    370                 375                 380

Leu Ala Phe Leu His Pro Pro Ala Leu Ser Glu Ala Ser Leu Ala Ala
385                 390                 395                 400

Asp Pro Arg Arg Phe Cys Ser Pro Asp Leu Arg Arg Leu Met Ala Pro
                405                 410                 415

Ile Leu Asp Gly Pro Pro Pro Ala Ala Thr Pro Ser Thr Pro Gln Ala
            420                 425                 430

Thr Arg Arg Pro Gln Ser Pro Leu Pro Ala Asp Leu Pro Asp Lys Leu
        435                 440                 445

Ala Val Gly Leu Glu Asn Ala His Arg Leu Ser Thr Ala Gln Lys Asn
    450                 455                 460

Lys Thr Val Glu Thr Asp Leu Asp Ile Ala Gln Asp Ser Asp Thr Leu
465                 470                 475                 480

Asp Leu Glu Met Leu Ala Pro Tyr Ile Ser Met Asp Asp Asp Phe Gln
                485                 490                 495

Leu Asn Ser Ser Glu Gln Leu Pro Lys Val His Arg Arg Pro Pro Arg
            500                 505                 510

Val Ala Arg Arg Pro Arg Ala Arg Ser Phe His Gly Leu Ser Pro Pro
        515                 520                 525

Ile Pro Glu Pro Ser Leu Leu Pro Arg Trp Gly Ser Asp Pro Arg Leu
    530                 535                 540

Asn Cys Ser Ser Pro Ser Arg Gly Asp Arg Pro Thr Ala Ser Leu Met
545                 550                 555                 560

Pro Gly Thr Arg Lys Arg Ala Leu Ala Gln Ser Ser Glu Asp Lys Gly
                565                 570                 575

Leu Glu Leu Leu Glu Ile Lys Pro Pro Lys Arg Ser Pro Arg Leu Glu
            580                 585                 590

Pro Gly Ser Phe Leu Leu Pro Pro Leu Ser Leu Ser Phe Leu Leu Gln
        595                 600                 605

Gly Arg Gln Leu Leu Gly Asn Gln Gln Asp Pro Arg Ala Pro Leu Val
    610                 615                 620

His Ser His Glu Pro Leu Gly Leu Ala Pro Ser Leu Leu Ser Leu Cys
625                 630                 635                 640
```

```
Gln His Glu Glu Thr Val Gln Pro Arg Asn His Phe Pro Pro Ala Ala
                645                 650                 655

Gly Leu Gly Gln Thr His
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<210> 17
<211> 1246
<212> PRT
<213> Homo sapiens

<400> 17

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Met Asn Gly Tyr Ala Glu Phe Pro Pro Ser Pro Ser Asn Pro Thr Lys
1               5                  10                  15

Glu Pro Val Glu Pro Gln Pro Ser Gln Val Pro Leu Gln Glu Asp Val
            20                  25                  30

Asp Met Ser Ser Gly Ser Ser Gly His Glu Thr Asn Glu Asn Cys Ser
        35                  40                  45

Thr Gly Arg Asp Ser Gln Gly Ser Asp Cys Asp Asp Ser Gly Lys Glu
    50                  55                  60

Leu Gly Met Leu Val Glu Pro Pro Asp Ala Arg Gln Ser Pro Asp Thr
65                  70                  75                  80

Phe Ser Leu Met Met Ala Lys Ser Glu His Asn Pro Ser Thr Ser Gly
                85                  90                  95

Cys Ser Ser Asp Gln Ser Ser Lys Val Asp Thr His Lys Glu Leu Ile
            100                 105                 110

Lys Thr Leu Lys Glu Leu Lys Val His Leu Pro Ala Asp Lys Lys Ala
        115                 120                 125

Lys Gly Lys Ala Ser Thr Leu Ala Thr Leu Lys Tyr Ala Leu Arg Ser
    130                 135                 140

Val Lys Gln Val Lys Ala Asn Glu Glu Tyr Tyr Gln Leu Leu Met Ser
145                 150                 155                 160

Ser Glu Gly His Pro Cys Gly Ala Asp Val Pro Ser Tyr Thr Val Glu
                165                 170                 175

Glu Met Glu Ser Val Thr Ser Glu His Ile Val Lys Asn Ala Asp Met
            180                 185                 190

Phe Ala Val Ala Val Ser Leu Val Ser Gly Lys Ile Leu Tyr Ile Ser
        195                 200                 205

Asp Gln Val Ala Ser Ile Phe His Cys Lys Arg Asp Ala Phe Ser Asp
    210                 215                 220
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```
Ala Lys Phe Val Glu Phe Leu Ala Pro His Asp Val Gly Val Phe His
225                 230                 235                 240

Ser Phe Thr Ser Pro Tyr Lys Leu Pro Leu Trp Ser Met Cys Ser Gly
                245                 250                 255

Ala Asp Ser Phe Thr Gln Glu Cys Met Glu Glu Lys Ser Phe Phe Cys
            260                 265                 270

Arg Val Ser Val Arg Lys Ser His Glu Asn Glu Ile Arg Tyr His Pro
        275                 280                 285

Phe Arg Met Thr Pro Tyr Leu Val Lys Val Arg Asp Gln Gln Gly Ala
    290                 295                 300

Glu Ser Gln Leu Cys Cys Leu Leu Leu Ala Glu Arg Val His Ser Gly
305                 310                 315                 320

Tyr Glu Ala Pro Arg Ile Pro Pro Glu Lys Arg Ile Phe Thr Thr Thr
                325                 330                 335

His Thr Pro Asn Cys Leu Phe Gln Asp Val Asp Glu Arg Ala Val Pro
            340                 345                 350

Leu Leu Gly Tyr Leu Pro Gln Asp Leu Ile Glu Thr Pro Val Leu Val
        355                 360                 365

Gln Leu His Pro Ser Asp Arg Pro Leu Met Leu Ala Ile His Lys Lys
    370                 375                 380

Ile Leu Gln Ser Gly Gly Gln Pro Phe Asp Tyr Ser Pro Ile Arg Phe
385                 390                 395                 400

Arg Ala Arg Asn Gly Glu Tyr Ile Thr Leu Asp Thr Ser Trp Ser Ser
                405                 410                 415

Phe Ile Asn Pro Trp Ser Arg Lys Ile Ser Phe Ile Ile Gly Arg His
            420                 425                 430

Lys Val Arg Val Gly Pro Leu Asn Glu Asp Val Phe Ala Ala His Pro
        435                 440                 445

Cys Thr Glu Glu Lys Ala Leu His Pro Ser Ile Gln Glu Leu Thr Glu
    450                 455                 460

Gln Ile His Arg Leu Leu Leu Gln Pro Val Pro His Ser Gly Ser Ser
465                 470                 475                 480

Gly Tyr Gly Ser Leu Gly Ser Asn Gly Ser His Glu His Leu Met Ser
                485                 490                 495

Gln Thr Ser Ser Ser Asp Ser Asn Gly His Glu Asp Ser Arg Arg Arg
            500                 505                 510

Arg Ala Glu Ile Cys Lys Asn Gly Asn Lys Thr Lys Asn Arg Ser His
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        515                 520                 525

Tyr Ser His Glu Ser Gly Glu Gln Lys Lys Lys Ser Val Thr Glu Met
    530                 535                 540

Gln Thr Asn Pro Pro Ala Glu Lys Lys Ala Val Pro Ala Met Glu Lys
545                 550                 555                 560

Asp Ser Leu Gly Val Ser Phe Pro Glu Glu Leu Ala Cys Lys Asn Gln
                565                 570                 575

Pro Thr Cys Ser Tyr Gln Gln Ile Ser Cys Leu Asp Ser Val Ile Arg
            580                 585                 590

Tyr Leu Glu Ser Cys Asn Glu Ala Ala Thr Leu Lys Arg Lys Cys Glu
        595                 600                 605

Phe Pro Ala Asn Val Pro Ala Leu Arg Ser Ser Asp Lys Arg Lys Ala
    610                 615                 620

Thr Val Ser Pro Gly Pro His Ala Gly Glu Ala Glu Pro Pro Ser Arg
625                 630                 635                 640

Val Asn Ser Arg Thr Gly Val Gly Thr His Leu Thr Ser Leu Ala Leu
                645                 650                 655

Pro Gly Lys Ala Glu Ser Val Ala Ser Leu Thr Ser Gln Cys Ser Tyr
            660                 665                 670

Ser Ser Thr Ile Val His Val Gly Asp Lys Lys Pro Gln Pro Glu Leu
        675                 680                 685

Glu Met Val Glu Asp Ala Ala Ser Gly Pro Glu Ser Leu Asp Cys Leu
    690                 695                 700

Ala Gly Pro Ala Leu Ala Cys Gly Leu Ser Gln Glu Lys Glu Pro Phe
705                 710                 715                 720

Lys Lys Leu Gly Leu Thr Lys Glu Val Leu Ala Ala His Thr Gln Lys
                725                 730                 735

Glu Glu Gln Ser Phe Leu Gln Lys Phe Lys Glu Ile Arg Lys Leu Ser
            740                 745                 750

Ile Phe Gln Ser His Cys His Tyr Tyr Leu Gln Glu Arg Ser Lys Gly
        755                 760                 765

Gln Pro Ser Glu Arg Thr Ala Pro Gly Leu Arg Asn Thr Ser Gly Ile
    770                 775                 780

Asp Ser Pro Trp Lys Lys Thr Gly Lys Asn Arg Lys Leu Lys Ser Lys
785                 790                 795                 800

Arg Val Lys Pro Arg Asp Ser Ser Glu Ser Thr Gly Ser Gly Gly Pro
                805                 810                 815
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Val Ser Ala Arg Pro Pro Leu Val Gly Leu Asn Ala Thr Ala Trp Ser
            820                 825                 830

Pro Ser Asp Thr Ser Gln Ser Ser Cys Pro Ala Val Pro Phe Pro Ala
        835                 840                 845

Pro Val Pro Ala Ala Tyr Ser Leu Pro Val Phe Pro Ala Pro Gly Thr
    850                 855                 860

Val Ala Ala Pro Pro Ala Pro Pro His Ala Ser Phe Thr Val Pro Ala
865                 870                 875                 880

Val Pro Val Asp Leu Gln His Gln Phe Ala Val Gln Pro Pro Pro Phe
                885                 890                 895

Pro Ala Pro Leu Ala Pro Val Met Ala Phe Met Leu Pro Ser Tyr Ser
            900                 905                 910

Phe Pro Ser Gly Thr Pro Asn Leu Pro Gln Ala Phe Phe Pro Ser Gln
        915                 920                 925

Pro Gln Phe Pro Ser His Pro Thr Leu Thr Ser Glu Met Ala Ser Ala
    930                 935                 940

Ser Gln Pro Glu Phe Pro Ser Arg Thr Ser Ile Pro Arg Gln Pro Cys
945                 950                 955                 960

Ala Cys Pro Ala Thr Arg Ala Thr Pro Pro Ser Ala Met Gly Arg Ala
                965                 970                 975

Ser Pro Pro Leu Phe Gln Ser Arg Ser Ser Ser Pro Leu Gln Leu Asn
            980                 985                 990

Leu Leu Gln Leu Glu Glu Ala Pro  Glu Gly Gly Thr Gly  Ala Met Gly
        995                 1000                1005

Thr Thr  Gly Ala Thr Glu Thr  Ala Ala Val Gly Ala  Asp Cys Lys
    1010                1015                1020

Pro Gly  Thr Ser Arg Asp Gln  Gln Pro Lys Ala Pro  Leu Thr Arg
    1025                1030                1035

Asp Glu  Pro Ser Asp Thr Gln  Asn Ser Asp Ala Leu  Ser Thr Ser
    1040                1045                1050

Ser Gly  Leu Leu Asn Leu Leu  Leu Asn Glu Asp Leu  Cys Ser Ala
    1055                1060                1065

Ser Gly  Ser Ala Ala Ser Glu  Ser Leu Gly Ser Gly  Ser Leu Gly
    1070                1075                1080

Cys Asp  Ala Ser Pro Ser Gly  Ala Gly Ser Ser Asp  Thr Ser His
    1085                1090                1095
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Thr Ser  Lys Tyr Phe Gly Ser  Ile Asp Ser Ser Glu  Asn Asn His
    1100                 1105                 1110

Lys Ala  Lys Met Asn Thr Gly  Met Glu Glu Ser Glu  His Phe Ile
    1115                 1120                 1125

Lys Cys  Val Leu Gln Asp Pro  Ile Trp Leu Leu Met  Ala Asp Ala
    1130                 1135                 1140

Asp Ser  Ser Val Met Met Thr  Tyr Gln Leu Pro Ser  Arg Asn Leu
    1145                 1150                 1155

Glu Ala  Val Leu Lys Glu Asp  Arg Glu Lys Leu Lys  Leu Leu Gln
    1160                 1165                 1170

Lys Leu  Gln Pro Gly Ser Arg  Arg Val Arg Ser Arg  Ser Cys Ala
    1175                 1180                 1185

Arg Ser  Thr Ser Gly Cys Arg  Arg Ala Ala Cys Pro  Gln Pro Ser
    1190                 1195                 1200

Thr Trp  Gln Asn Val Phe Thr  Val Lys Thr Arg Lys  Lys Val Ile
    1205                 1210                 1215

Phe Ala  Tyr His Met Arg Lys  Ile Phe Leu Leu Trp  Asp Ser Ala
    1220                 1225                 1230

Lys Cys  Arg Thr Pro Lys Lys  Thr Lys Met Asp Pro  Pro
    1235                 1240                 1245
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<210> 18
<211> 585
<212> PRT
<213> Homo sapiens

<400> 18

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Met Gly Ser Phe Ser Ser His Met Thr Glu Phe Pro Arg Lys Arg Lys
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Gly Ser Asp Ser Asp Pro Ser Gln Ser Gly Ile Met Thr Glu Lys Val
            20                  25                  30

Val Glu Lys Leu Ser Gln Asn Pro Leu Thr Tyr Leu Leu Ser Thr Arg
        35                  40                  45

Ile Glu Ile Ser Ala Ser Ser Gly Ser Arg Glu Ala His Ser Gln Thr
    50                  55                  60

Glu Lys Arg Arg Arg Asp Lys Met Asn Asn Leu Ile Glu Glu Leu Ser
65                  70                  75                  80

Ala Met Ile Pro Gln Cys Asn Pro Met Ala Arg Lys Leu Asp Lys Leu
                85                  90                  95

Thr Val Leu Arg Met Ala Val Gln His Leu Arg Ser Leu Lys Gly Leu
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```
            100                 105                 110

Thr Asn Ser Tyr Val Gly Ser Asn Tyr Arg Pro Ser Phe Leu Gln Asp
        115                 120                 125

Asn Glu Leu Arg His Leu Ile Leu Lys Thr Ala Glu Gly Phe Leu Phe
    130                 135                 140

Val Val Gly Cys Glu Arg Gly Lys Ile Leu Phe Val Ser Lys Ser Val
145                 150                 155                 160

Ser Lys Ile Leu Asn Tyr Asp Gln Ala Ser Leu Thr Gly Gln Ser Leu
                165                 170                 175

Phe Asp Phe Leu His Pro Lys Asp Val Ala Lys Val Lys Glu Gln Leu
            180                 185                 190

Ser Ser Phe Asp Ile Ser Pro Arg Glu Lys Leu Ile Asp Thr Lys Thr
        195                 200                 205

Gly Leu Gln Val His Ser Asn Leu His Ala Gly Arg Thr Arg Val Tyr
    210                 215                 220

Phe Gly Ser Arg Arg Ser Phe Phe Cys Arg Ile Lys Ser Cys Lys Ile
225                 230                 235                 240

Ser Val Lys Glu Glu His Gly Cys Leu Pro Asn Ser Lys Lys Lys Glu
                245                 250                 255

His Arg Lys Phe Tyr Thr Ile His Cys Thr Gly Tyr Leu Arg Ser Trp
            260                 265                 270

Pro Pro Asn Ile Val Gly Met Glu Glu Glu Arg Asn Ser Lys Lys Asp
        275                 280                 285

Asn Ser Asn Phe Thr Cys Leu Val Ala Ile Gly Arg Leu Gln Pro Tyr
    290                 295                 300

Ile Val Pro Gln Asn Ser Gly Glu Ile Asn Val Lys Pro Thr Glu Phe
305                 310                 315                 320

Ile Thr Arg Phe Ala Val Asn Gly Lys Phe Val Tyr Val Asp Gln Arg
                325                 330                 335

Ala Thr Ala Ile Leu Gly Tyr Leu Pro Gln Glu Leu Leu Gly Thr Ser
            340                 345                 350

Cys Tyr Glu Tyr Phe His Gln Asp Asp His Asn Asn Leu Thr Asp Lys
        355                 360                 365

His Lys Ala Val Leu Gln Ser Lys Glu Lys Ile Leu Thr Asp Ser Tyr
    370                 375                 380

Lys Phe Arg Ala Lys Asp Gly Ser Phe Val Thr Leu Lys Ser Gln Trp
385                 390                 395                 400
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```
Phe Ser Phe Thr Asn Pro Trp Thr Lys Glu Leu Glu Tyr Ile Val Ser
                405                 410                 415

Val Asn Thr Leu Val Leu Gly His Ser Glu Pro Gly Glu Ala Ser Phe
            420                 425                 430

Leu Pro Cys Ser Ser Gln Ser Ser Glu Glu Ser Ser Arg Gln Ser Cys
        435                 440                 445

Met Ser Val Pro Gly Met Ser Thr Gly Thr Val Leu Gly Ala Gly Ser
    450                 455                 460

Ile Gly Thr Asp Ile Ala Asn Glu Ile Leu Asp Leu Gln Arg Leu Gln
465                 470                 475                 480

Ser Ser Ser Tyr Leu Asp Asp Ser Ser Pro Thr Gly Leu Met Lys Asp
                485                 490                 495

Thr His Thr Val Asn Cys Arg Ser Met Ser Asn Lys Glu Leu Phe Pro
            500                 505                 510

Pro Ser Pro Ser Glu Met Gly Glu Leu Glu Ala Thr Arg Gln Asn Gln
        515                 520                 525

Ser Thr Val Ala Val His Ser His Glu Pro Leu Leu Ser Asp Gly Ala
    530                 535                 540

Gln Leu Asp Phe Asp Ala Leu Cys Asp Asn Asp Asp Thr Ala Met Ala
545                 550                 555                 560

Ala Phe Met Asn Tyr Leu Glu Ala Glu Gly Gly Leu Gly Asp Pro Gly
                565                 570                 575

Asp Phe Ser Asp Ile Gln Trp Thr Leu
            580                 585
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<400> 20
tctagaacta gtggatc 17

<210> 21
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<400> 21
cccaagctta cgcgtggtct ttgaagtcaa cctcacc 37

<210> 22
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<400> 22
agctcgaaat taaccctcac taaagg 26

<210> 23
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<400> 24
gcgtcgactg atgagcagcg gcgccaacat cacc 34

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gataagaatg cggccgcaga tctgggtccg aagcacacg 39

<210> 26
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<400> 26
cattacttat ctagagctcg 20

<210> 27
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<400> 27
cgggatcctc atggcggcga ctactgccaa cc 32

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<400> 28
gacagttgct tgagtttcaa cc 22

<210> 29
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<400> 29
ttatgagctt gctcatcagt tgcc 24

<210> 30
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<220>
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<400> 30
cctcacacgc aaatagctga tgg 23

<210> 31
<211> 35
<212> DNA
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<400> 31
ccgctcgagt gatgagcagc ggcgccaaca tcacc 35

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<400> 32
ccgctcgagt ggcagctaca ggaatccacc 30

<210> 33

<211> 28
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<210> 34
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<400> 34
tcgagctggg cagggtacgt ggcaaggc 28

<210> 35
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<400> 35
tcgagccttg ccacgtaccc tgcccagc 28

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<220>
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<400> 36
gtaaaacgac ggccagt 17

<210> 37
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<400> 37
ggaaacagct atgaccatg 19

<210> 38
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<400> 38
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<400> 39
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tcgagccttg ccacgtgacc tgcccagc 28

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tcgagctggg caggttgcgt ggcaaggc 28

<210> 43
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<400> 45
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<210> 46
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<400> 46
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<400> 53
cccaaggaga ggcgtgat 18

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<400> 54
gggatcctcg tcgccactg 19

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<400> 55
atgcagtacc cagacggatt tc 22

<210> 56
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<400> 57
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<400> 62
caatgatgag ggaaacactg 20

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<400> 63
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<400> 66
gcgtccgcag ccccagttg 19

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gaggtgtttc aattcatcgt ct 22

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<210> 71
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ctgcaggtca cacaacgtaa ttcacaca 28

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<400> 72
gggatccgta tgacagctga caaggag 27

<210> 73
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ggtcgacgtc acaggacgta gttgacaca 29

<210> 74
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<400> 74
gaatccatga gcaaggaggc cgtg 24

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ggtcgacgtc aaacaacagt gttagttga 29

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<400> 76
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gacagtatca cgcctctcct t 21

<210> 79
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<400> 79
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<210> 80
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<223> Synthetic Sequence

<400> 80
atgctgaact gtgccgaaaa ctgt 24

<210> 81
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<400> 81

gaacagtggg gtgggtcctc ttt 23

<210> 82
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<400> 82
ggaattctga gtctgaac 18

<210> 83
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<400> 83
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<210> 86
<211> 46
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<400> 86
gatcggtcac gtgtccaatg gacacgtgac caatggtcac gtgtcc 46

<210> 87
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<400> 87
gatcggatac gtgaccattg gttacgtgtc cattggatac gtgacc 46

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<400> 89
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<400> 96
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<210> 98
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<400> 98
ccccgttact gcctggccct tgctca 26

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<400> 99
agccgagggg gtctgcgagt atgttgc 27

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gctgctgacc ctcgccgttt ctgtagt 27

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ggtacacgtg accc 14

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<400> 113
tgaacacgtg actc 14

<210> 114
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<400> 114
gggccacgtg acct 14

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<400> 115
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<400> 116
ctaacacgtg accg 14

<210> 117
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gaaccacgtg agct 14

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tgaacacgtg acac 14

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gggtcacgtg actc 14

<210> 120
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<223> nucleotide can be either g or t

<220>
<221> misc_feature
<222> (3)..(3)
<223> nucleotide can be either a or g

<400> 120
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<210> 121
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<400> 121
gccctacgtg accc 14

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<400> 122
gccctacgtg ttcc 14

<210> 123
<211> 14
<212> DNA
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<400> 123
gccctacgtg accc 14

<210> 124
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<213> Artificial Sequence

<220>
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<222> (4)..(4)
<223> nucleotide can be a, c, t or g

<220>
<221> misc_feature
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<223> nucleotide can be a, c, t or g

<400> 124
gcancacgtg nacc 14

<210> 125
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<220>
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<400> 125

Asp Asn Asp Gln Gly Ser Ser Ser Pro Ser Asn Asp Glu Ala Ala Cys
1 5 10 15

<210> 126
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Sequence

<400> 126

Lys Asp Lys Gly Ser Ser Leu Glu Pro Arg Gln His Phe Asn Ala Leu
1 5 10 15

Asp Val Gly Cys
20